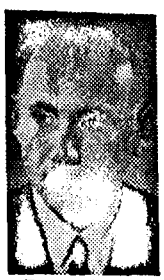
The Washington Post

SATURDAY, JULY 15, 1967

Science and Man . . . By Joshua Lederberg

Food From the World's Factories?

"THE WORLD Food Problem" is a comprehensive report by a panel of specialists under the chairmanship of Dr. Ivan L. Bennett Jr., deputy director of the Office of Science and Technology in the White House.



Lederberg

It is the most authoritative study so far of the problem to which President Johnson referred when he said: "Next to the pursuit of peace, the really greatest challenge to the human family is the race between food supply and population increase. That race tonight is being lost."

From a strictly technical standpoint, there is not much of a problem. Food is fuel for the machinery of the human body and building blocks for its structure. Each of us consumes about one million calories a year, the equivalent of about 150 watts of electricity.

That megacalorie of energy is worth about a dollar in raw fuel—but the human body won't burn coal or oil. The earth's existing plant life, operating at about 2 per cent efficiency, still traps enough energy from sunlight to stoke 300 times the present human population. However, we don't digest wood or seaweed, and most of this photosynthetic product is consumed by fire or microbial decomposition or is funneled through the food chains of other animals.

THE CHEAPEST foods we are equipped to use are sugar and starches. At 3 cents a pound these are about 20 times as costly per megacalorie as raw industrial fuels, but in the present state of the world market, agriculture is still the cheapest route to food energy. The industrial production of food calories might become competitive at about 10 cents a pound, judging from the prices of related chemicals manufactured from petroleum or natural gas.

If overal-all coversion of energy and carbon into caloric nutrients were the essential issue, the chemical industry could feed the world at a production cost of about $100 per capita per annum. This estimate takes into account the protein constitutents needed in human nutrition; amino acids like lysine, tryptophan and threonine.

Establishing such an industry would require a large investment to handle a daily output of 10 billion pounds of concentrated foodstuffs. This is about ten times the present output of refined fuel for motor vehicles in the United States alone. If there were a market for such an output, there is little doubt that the industrialized countries, perhaps even the United States alone, could meet it without any help from agriculture.

We can rest easy about such an extreme technical solution, however, because the problem is not primarily a technical one. For some time we have heard urgent and realistic warnings about the impending world shortage of food but there has been a steady decline in world prices of food staples.

How can we account for such a paradox? The answer is that hunger and effective demand are not related: malnourished people are poor and poor people are becoming poorer because of unchecked population growth.

THE REAL problem is to provide a social and economic framework that will permit people to achieve a decent level of individual productivity. We have to help others break the circular chain of poverty, unemployment, malnutrition and undereducation.

In the exercise of our scientific leadership, we must be careful not to make agricultural self-sufficiency an overriding goal except as a necessary part of general economic development. It is in the underdeveloped, meat-poor countries that we may need to encourage the most sophisticated industrial fabrication of special foods as supplements to indigenous agricultural products.